

CLAIM AMENDMENTS:

Claims 1-17 (Canceled).

Claim 18 (Original): A method of forming a trench MOSFET device comprising:

providing a substrate of a first conductivity type;
depositing an epitaxial layer of said first conductivity type over said substrate, said epitaxial layer having a lower majority carrier concentration than said substrate;
forming a body region of a second conductivity type within an upper portion of said epitaxial layer;
etching a trench extending into said epitaxial region from an upper surface of said epitaxial layer, said trench extending to a greater depth from said upper surface of said epitaxial layer than does said body region;
forming a doped region of said first conductivity type between a bottom portion of said trench and said substrate, said doped region having a majority carrier concentration that is lower than that of said substrate and higher than that of said epitaxial layer;
forming an insulating layer lining at least a portion of said trench;
forming a conductive region within said trench adjacent said insulating layer; and
forming a source region of said first conductivity type within an upper portion of said body region and adjacent said trench.

Claim 19 (Original): The method of claim 18, wherein said step of forming said doped region comprises: (a) implanting a dopant of said first conductivity type into said epitaxial region; and (b) diffusing dopant of said first conductivity type at elevated temperature.

Claim 20 (Original): The method of claim 19, wherein said dopant is diffused until the doped region spans more than 50% of the distance from said trench bottom to said substrate.

Claim 21 (Original): The method of claim 19, wherein said dopant is diffused until the doped region spans 100% of the distance from said trench bottom to said substrate.

Claim 22 (Original): The method of claim 19, wherein said first conductivity type is n-type conductivity and said second conductivity type is p-type conductivity.

Claim 23 (Original): The method of claim 22, wherein said dopant is phosphorous.

Claim 24 (Original): The method of claim 18, wherein said steps of forming said trenches and forming said doped region comprise: (a) forming a trench mask on said epitaxial layer; (b) etching said trench through said trench mask; (c) implanting a dopant of said first conductivity type through said trench mask; and (c) diffusing said dopant of said first conductivity type at elevated temperature.

Claim 25 (Original): The method of claim 24, wherein said elevated temperature is provided by a step in which a sacrificial oxide is grown along walls of said trench.

Claim 26 (Original): The method of claim 18, wherein said trench MOSFET device is a silicon device.

Claim 27 (Original): The method of claim 18, further comprising:

- forming a metallic drain contact adjacent said semiconductor substrate,
- forming a metallic source contact adjacent an upper surface of said source region, and
- forming a metallic gate contact adjacent an upper surface of said conductive region remote from said source region.